CHAPTER 4: FIRST PAPER FEED SECTION

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LED PDTC Paper detection sensor
– Lights up when reflected light detected
Test Mode No. 55 Paper detection sensor
– Short interval beeps when reflected light detected

THEORY OF OPERATION

1. Paper Feed Tray Mechanism

- Basic

The Paper feed tray holds paper and the Paper detection sensor checks paper presence on the tray.

- Paper Side Guides Movement

The Paper side guides can be manually adjusted to the width of paper.

Sliding either of the two Paper side guides toward loaded paper centers the paper on the tray by moving the other side guide inward.

The Paper side guides have the Slide racks attached, which are linked by the Slide rack gear.

The movement of one side guide is transmitted to the other one by the racks and gear, enabling their synchronized movement.

- Paper Detection Sensor Function

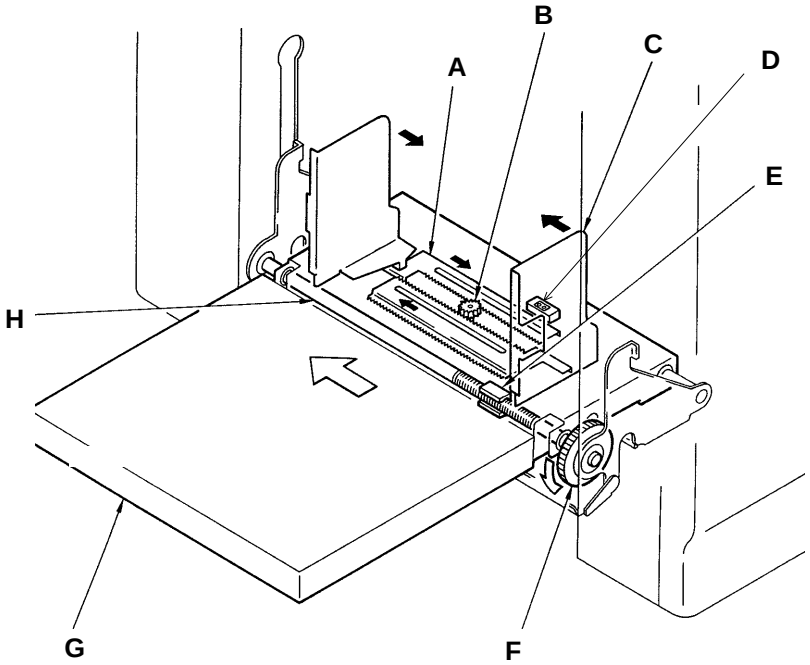
The Paper detection sensor checks the presence of paper on the Paper feed tray.

The machine goes into the printing mode only when paper is present on the Paper feed tray.

- Paper Positioning(B4)

The Paper feed tray can be shifted in both left and right directions by maximum 20mm (5mm for A3 or Ledger size paper), by manually turning the Adjustment dial.

The Adjustment dial is attached at the end of the Adjustment shaft A, which is rotated by the turn of the dial. By the rotation of the shaft, the Adjustment nut, which engages with the screw-face of the shaft, is moved to the left or right, causing the tray to move to the left or right.



A: Slide rack
B: Slide rack gear
C: Side guide
D: Paper detection sensor
E: Adjustment nut
F: Adjustment dial
G: Paper feed tray
H: Adjustment Shaft A

2. Paper Feed Tray Sliding Mechanisms(A3)

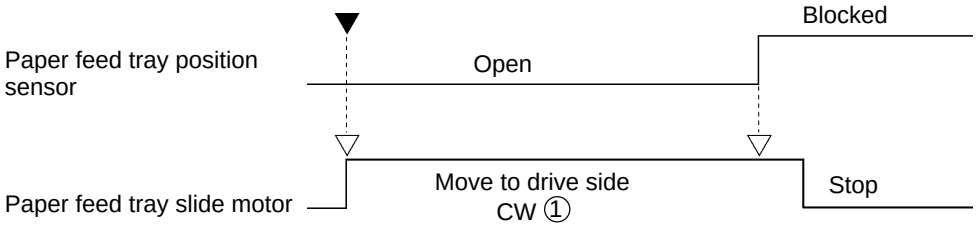
- Paper Feed Tray Slide Mechanism; A3 Machine (Horizontal Printing Position)

When the Horizontal print position key is pressed, the Paper feed tray slide motor is activated to move the paper feed tray by 10 mm to the left/right. Every time the Print position key is pressed, the paper feed tray moves by 0.5 mm. The center position of the paper feed tray is checked by the Paper feed tray position sensor. A safety switch is used to check the safety to the left and right so that the paper feed tray will not exceed a moving range.

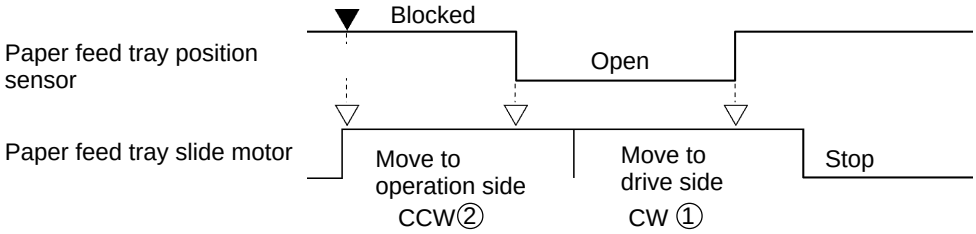
- Paper Feed Tray Initialization Mechanism

The print position is automatically returned to the center in the following cases:
1) when the power switch is turned ON, 2) when the “Centering” button is pressed, and 3) when the “RESET” button is pressed.

The Paper feed tray is towards the Operation side.
(The light path of the Paper feed tray position sensor is opened.)



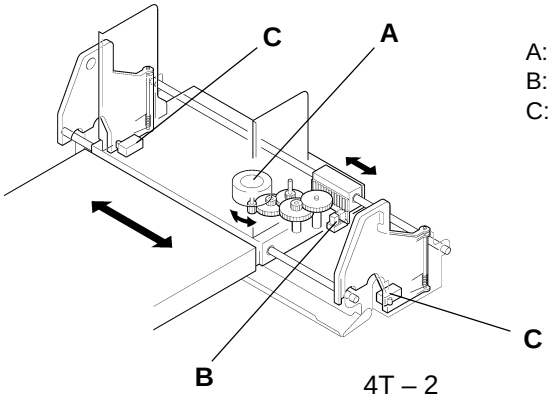
The Paper feed tray is in the center position or towards the drive side.
(The light path of the Paper feed tray position sensor is blocked.)



① If the Paper feed tray is located on the operation side (the Paper feed tray position sensor is opened) at centering start, the Paper feed tray slide motor will rotate in the clockwise until the light path of the Paper feed tray position sensor is blocked.

② If the Paper feed tray is located on the center or drive side (the Paper feed tray position sensor is blocked) at centering start, the Paper feed tray slide motor will rotate in the counter clockwise direction until the light path of the position sensor is opened, and then the motor is rotated in reverse until the light path is blocked again.

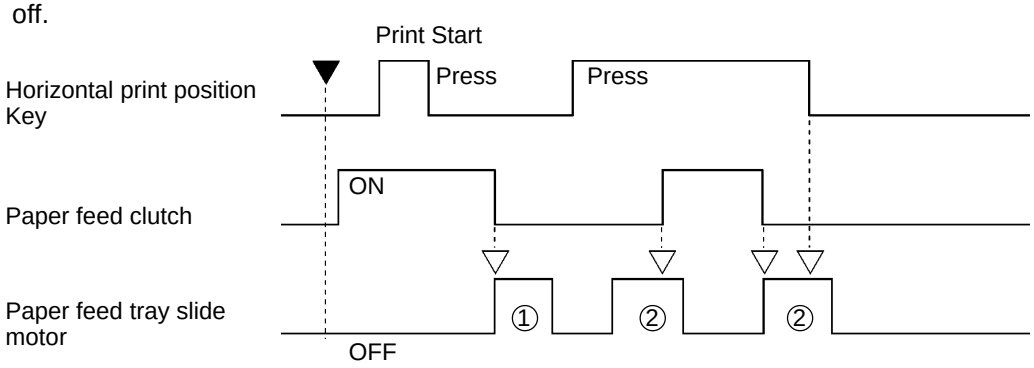
③ If the paper feed position sensor remains unchaged within 165 pulses (about 15mm) after the paper feed tray slide motor is turned on, “T30 CALL SERVICE” will be displayed.



A: Paper feed tray slide motor
B: Paper feed tray position sensor
C: Paper feed tray safety SW

- Paper Feed Tray Slide Mechanism during printing

Only while the Paper feed clutch is turned off, the Paper feed tray slide motor runs to move the Paper feed tray to the left/right. If the Horizontal print position key is pressed while the Paper feed clutch is turned on, the paper feed tray will move to the left/right after the clutch is turned off.

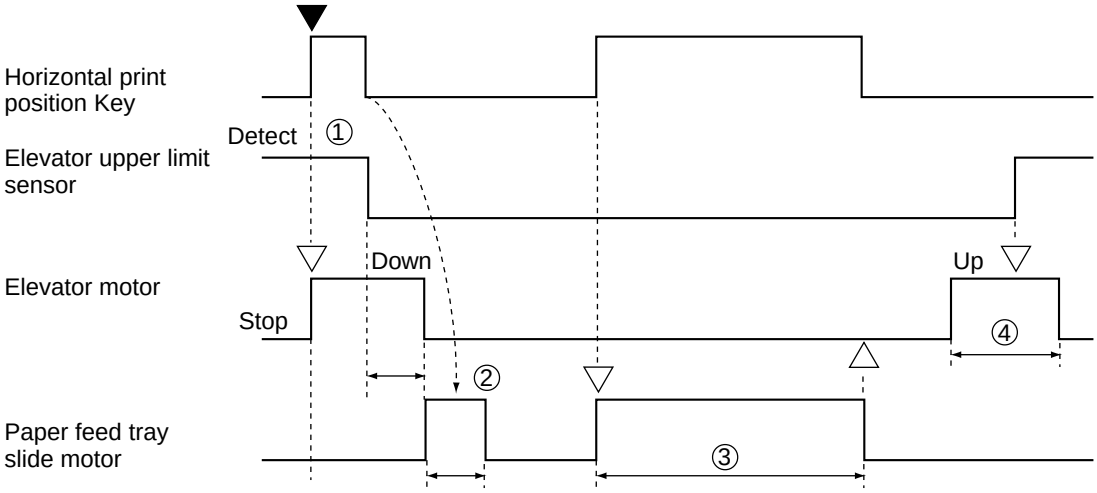


① If the Horizontal print position key is pressed while the Paper feed clutch is turned on, the slide motor will run after the clutch is turned off.

② If the Horizontal print position key is held down, sliding operation will be performed when the Paper feed clutch is turned off. If the Paper feed clutch is turned on during continuous operation, the Paper feed tray will stop once and restart moving after the Paper feed clutch is turned off.

- Paper Feed Tray Slide Mechanism during idle condition

If the Horizontal print position key is pressed while the Elevator upper-limit sensor is detecting the paper feed tray at print suspension time, the slide motor will run after lowering the the paper feed tray. The paper feed tray will move to the left/right that much, and then, it will move up until the upper-limit sensor detects it again.



① If the Elevator upper-limit sensor detects the paper feed tray, the elevator will be lowered.

② After confirming that the elevator motor has stopped, the Paper feed tray starts moving to the left/right.

③ If the Elevator upper-limit sensor does not detect the paper feed tray, operation will start the moment the print position key is pressed.

④ After moving to the left/right, the elevator motor runs to move up the paper feed tray until the Elevator upper-limit sensor is turned on.

LED PTLS Paper size detection sensor
– Lights up when reflected light detected.
Test Mode No. 2 Paper size detection sensor
– Short interval beeps when reflected light detected.

3. Paper Width Detection System

- Basic

The Paper feed tray is equipped with the Paper size potentiometer and Paper size det. sensor, which check the size and set direction of paper loaded on the tray.

According to the detected paper size and direction, the Jump wings are automatically positioned in the Suction unit to secure better paper ejection and an image area is limited on a master not to go beyond printing paper size.

- Paper Width Detection

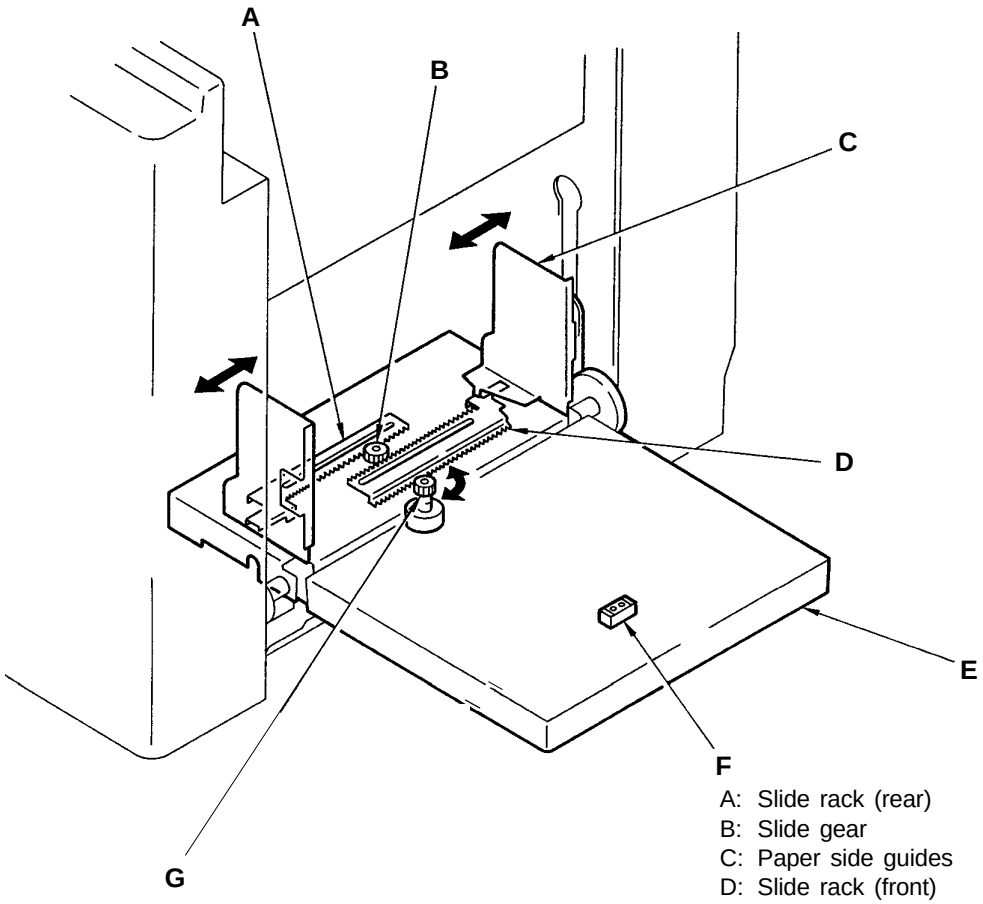
The movement of the Paper side guides are transmitted to the Paper size potentiometer via the Slide racks.

When the side guides are moved and set against the paper on the Paper feed tray, the potentiometer rotates and detects the paper width.

- Paper Direction Detection

The Paper size det. sensor checks whether paper is loaded on the paper feed tray, longways or sideways.

If the sensor detects paper (reflected light), it is assumed that paper is loaded longways.



A: Slide rack (rear)
B: Slide gear
C: Paper side guides
D: Slide rack (front)
E: Paper feed tray
F: Paper size det. sensor
G: Paper size potentiometer

Paper Size Definition

(1) Metric Models

Paper width(mm)	Paper Size Det. Sensor Status	Defined Paper Size
307~292	ON OFF	A3(Portrait) A4(Landscape)
291~269	–	No definition
268~252.0	ON OFF	B4(Portrait) B5(Landscape)
251~227	–	No definition
226~206	ON OFF	Fools cap A4(Portrait)
205~193	–	No definition
192~178	ON OFF	No definition B5(Portrait)
177~68	–	No definition

(2) US Models

Paper width(mm)	Paper Size Det. Sensor Status	Defined Paper Size
307~292	ON	No definition
291~274	ON OFF	Ledger(Portrait) Letter(Landscape)
273~226	–	No definition
225~212	ON OFF	Legal(Portrait) Letter(Portrait)
210~151	–	No definition
150~136	ON OFF	No definition Statement(Portrait)
135~68	–	No definition

Motor Control PCB LEDI
– Lights up when pressed.
LED P-UP Elevator Upper limit sensor
– Lights up when pressed.

4. Paper Feed Tray Elevation System

- Basic

The Paper feed tray can move up and down depending upon the function selected.

- Paper Detection Sensor

The Paper detection sensor checks whether the paper is set on the Paper feed tray.
The START button is only active when the paper detection sensor detects the paper on the Tray (the sensor's light is reflected back).

- Elevation of Feed Tray

When the START button is pressed, the elevator motor lifts the Paper feed tray until the Upper limit sensor of the Tray is pressed.
When the Upper limit sensor is pressed, the Elevator motor turns in the reverse direction to lower the Tray down just a little bit and then rotates in the original direction again to raise the Tray until the Upper limit sensor is pressed for the second time.
Printing is then started by the Main motor, turning the Drum.

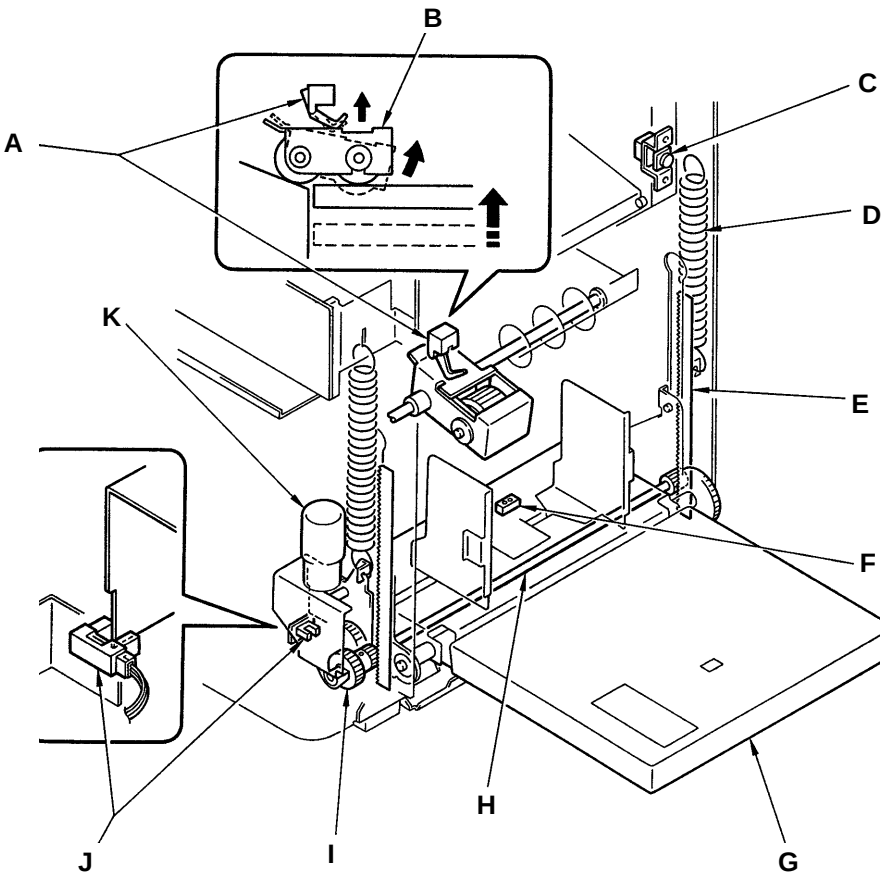
- Elevation during printing

During the printing as the height of the paper descreases (Upper limit sensor is released), the Elevator motor rotates to raises the tray until the Upper limit sensor is pressed again.
This operation is repeated to maintain the paper feed tray height, until the paper supply is depleted.

- Lowering of Feed Tray

The Paper detection sensor detects when the paper has run out, (the sensor's light does not reflect back).
The Elevator motor rotates to bring the Tray down, until the light path of the Lower limit sensor is cut.
If the Elevator down button is pressed while the machine is idle, the Elevator motor turns to lower the Tray until the button is released or the light path of the Lower limit sensor is cut.

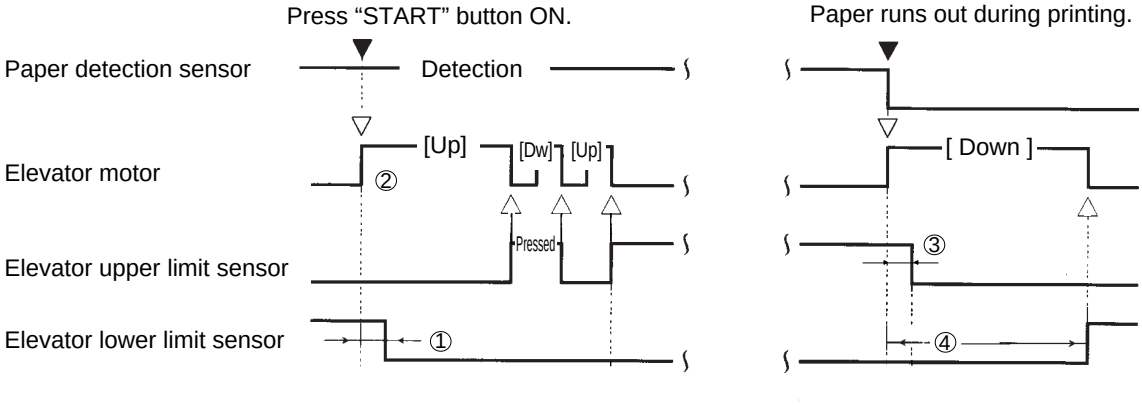
A: Upper limit sensor
B: Scraper unit
C: Elevator down button
D: Elevator spring
E: Elevator rack
F: Paper detection sensor
G: Paper feed tray
H: Elevator shaft
I: Elevator gear
J: Lower limit sensor
K: Elevator motor



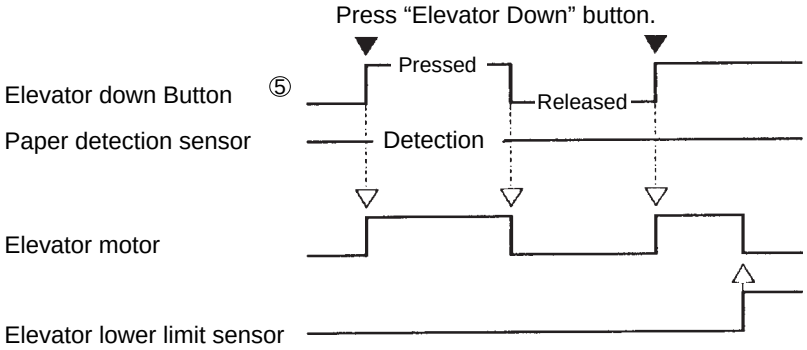
Test Mode No. 3 Elevator lower limit sensor
– Short interval beeps when light path is blocked.
No. 12 Elevator down button
– Short interval beeps when pressed.
No. 102 Elevator operation

- Timing Chart -

Paper Feed Tray Elevation System



During Idling



① If the light path of the Elevator lower limit sensor has not been opened **within 3 seconds** after the Elevator motor starts to raise the Paper feed tray, the machine assumes the Elevator motor has been locked and displays the error code **[T 02]**.
② If the actuator of the Elevator upper limit sensor has not been pressed (to open the light path of the sensor) **within 9 seconds** after the Elevator motor starts to raise the Paper feed tray, the machine assumes the Elevator motor has been locked and displays the error code **[T 02]**.
③ If the actuator of the Elevator upper limit sensor has not been released (to cut the light path of the sensor) **within 3 seconds** after the Elevator motor starts to lower the Paper feed tray, the machine assumes the Elevator motor has been locked and displays the error code **[T 02]**.
④ If the light path of the Elevator lower limit sensor has not been cut **within 9 seconds** after the Elevator motor starts to lower the Paper feed tray, the machine assumes the Elevator motor has been locked and displays the error code **[T 02]**.
⑤ The Elevator down button cannot be activated while the machine is printing.

T2 (Elevator Motor Lock)
• Elevator upper-limit sensor not turned on/off
• Elevator lower-limit sensor not turned on/off

5. Paper Feed Tray Safety System

- Basic

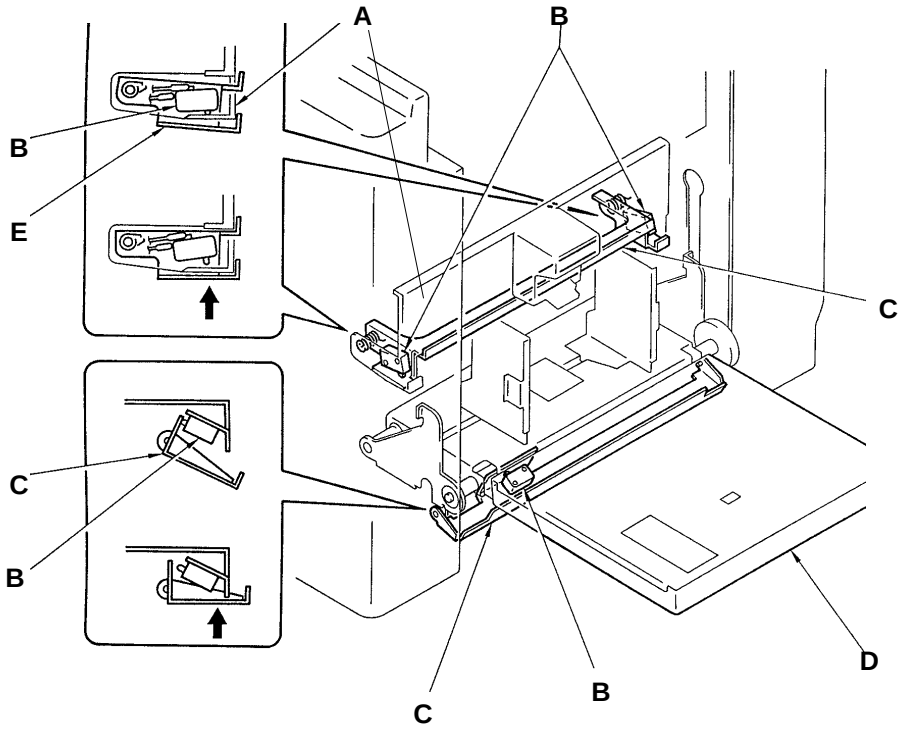
The Paper feed tray is equipped with safety systems.

- Paper Feed Tray Safety System

The safety systems are located at the bottom of the Paper feed cover and under the Paper feed tray.

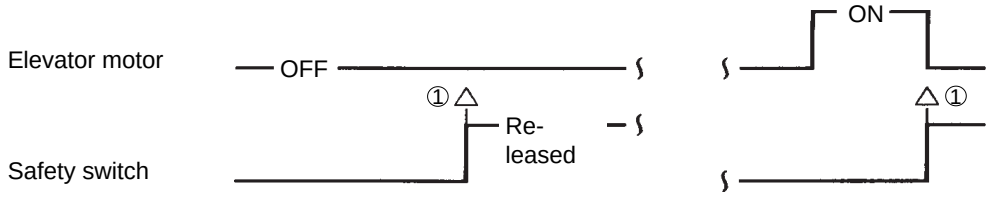
If the actuator plate is pressed in either of these safety systems, safety switches are released in the safety system whose actuator plate is pressed, by which the machine assumes that an obstacle has been stuck on or under the Paper feed tray and displays an error message to interrupt the machine operation.

A: Paper feed cover
B: Safety switch
C: Safety switch actuator plate
D: Paper feed tray
E: Safety switch bracket



- Timing Chart -

Paper feed tray safety system



① When the Safety switch is released, the machine assumes that an obstacle has been stuck on or under the Paper feed tray and the Elevator motor makes an emergency stop, causing the error message “CHECK PAPER FEED AREA” displayed.
In normal operating condition, the Safety switches are pressed.

6. Paper Feed Pressure Select System

- Basic

Paper feed pressure is changed by the Paper feed pressure adjustment lever.

- Paper Feed Pressure Adjustment Lever

The Paper feed pressure adjustment lever is located above the Scraper unit and positioned at two levels, high ("NORMAL") and low ("CARD"), securely with the help of the Lever spring attached to the left side of the lever.

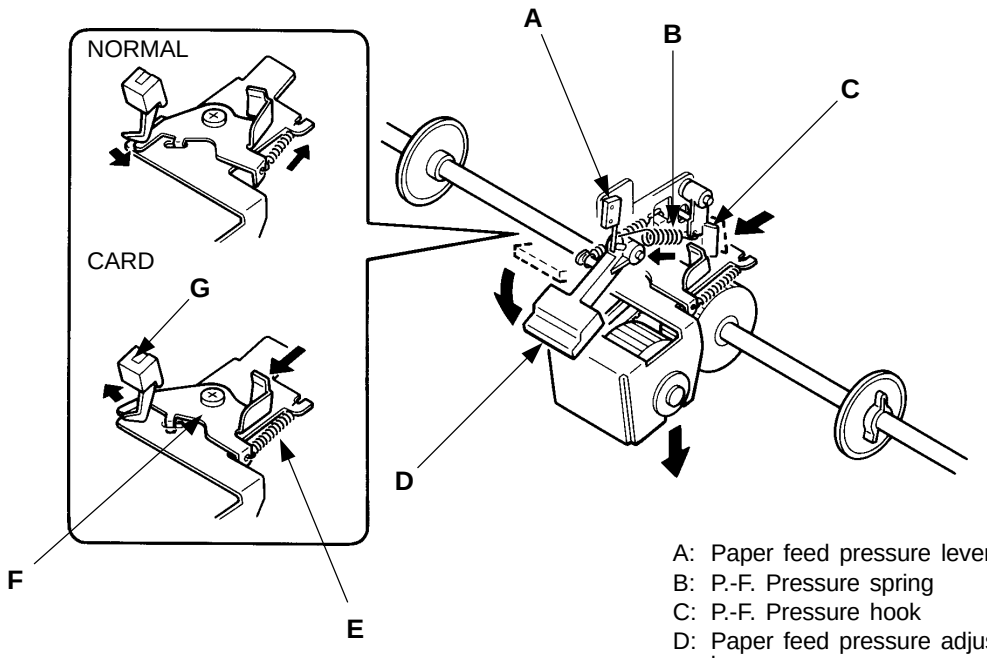
- Pressure Selection

The P.-F. Pressure spring is hooked to the Paper feed pressure adjustment lever at one end and to the P.-F. Pressure hook at the other end.

The lever, when set low for "CARD", pulls the hook via the spring. The pulled hook pushes down the Scraper ass'y against the loaded paper, giving more feeding pressure than by the assembly's weight. When the lever is set high for "NORMAL", the feeding pressure is less because no pressure is given other than the weight of the Scraper ass'y with the relaxed spring.

- Paper Feed Pressure Switch

Shifting the paper feed pressure adjustment lever to “CARD” presses the Paper Feed Pressure switch and causes the jump wing to change its operation. When “CARD” is selected, the upper-limit arm causes the paper feed tray upper-limit position to be slightly higher.



A: Paper feed pressure lever SW
B: P.-F. Pressure spring
C: P.-F. Pressure hook
D: Paper feed pressure adjustment lever
E: Upper arm spring
F: Upper arm plate
G: Elevator upper limit sensor

LTD PDF2 Paper feed clutch sensor
– Lights up when light path is blocked.
LED P-IN Paper feed detection sensor
– Lights up when light path is blocked.

7. First Paper Feed Rollers Rotary System (Activate by the paper feed clutch sensor)

- Basic

The Scraper and Pickup rollers are driven by the Paper feed clutch.

- Paper Feed Clutch Sensor & P Disc

The Paper feed clutch is activated by the paper feed clutch sensor.
When the Main motor rotates, the P disc rotates clockwise through the Paper feed clutch sensor.
If the light path of the Paper feed clutch sensor is opened, the Paper feed clutch is engaged.
If the light path of the Paper feed clutch sensor is blocked, the Paper feed clutch is disengaged.

- Transmission of Rotation Power

The Paper feed clutch is driven by the Main belt.
When the Paper feed clutch is activated, clutch components are engaged by the electromagnet, transmitting the rotation of the Main belt to the Pickup roller via the Pickup roller shaft.
The Pickup and Scraper rollers drive paper to the second paper feed section.

- Prevention of Brake Effect by Pickup and Scraper Rollers

The Pickup and Scraper rollers have one-way bearings built-in.
The one-way bearings allow the paper to feed into the second paper feed section freely.

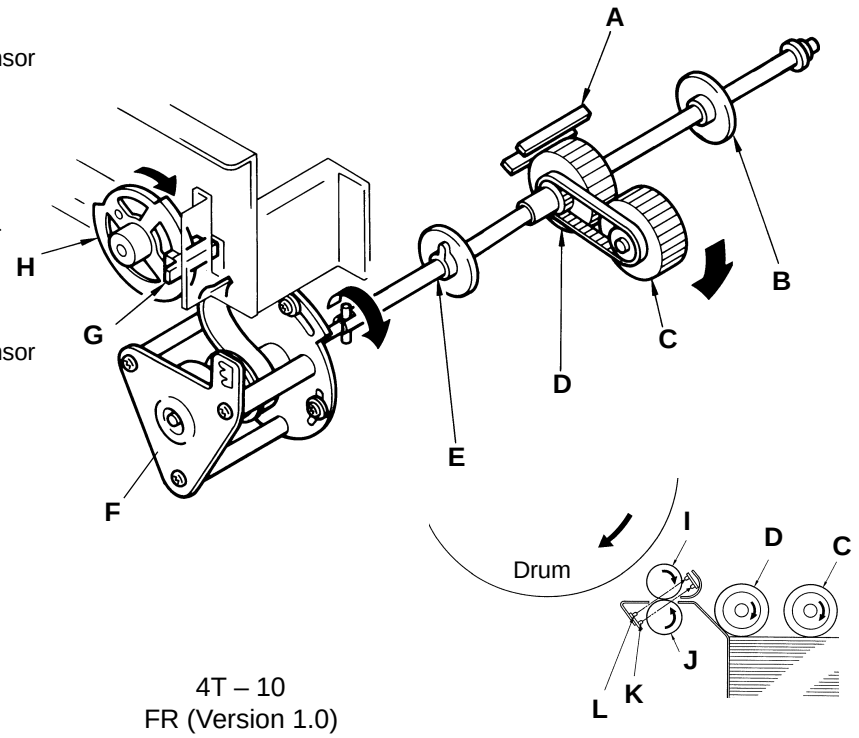
- Paper Feed Detection Sensor

To monitor the timing of paper transfer to the second paper feed section, a photo sensor, i.e. Paper feed detection sensor, is installed before the Guide roller.
When the paper feed detection sensor detects paper, the paper feed clutch is disengaged a preset period later and the first paper feed operation is completed.
At this time, the leading edge of the paper comes into contact with the guide and timing rollers to sag. In order to cause the paper to sag at a constant rate before second paper feed starts, even if a printing speed changes, the OFF timing of the paper feed clutch is changed depending on the printing speed and the type of printing paper used.(Note 1)
If the light path of the Paper feed clutch sensor is blocked by the P disc before the Paper feed detection sensor detects paper, the paper feed clutch is disengaged at once to end the first paper feed operation even though the Paper feed detection sensor has not detected paper.

[Note 1]

The paper sag rate can be adjusted depending on setting of the paper in the user mode and the paper feed clutch OFF delay time of the Memory switch(Test mode).

A: Paper feed detection sensor
B: Paper guide roller
C: Scraper roller
D: Pickup roller
E: Pickup roller shaft
F: Paper feed clutch
G: Paper feed clutch sensor
H: P Disc
I: Guide roller
J: Timing roller
K: Paper feed detection sensor
L: Paper sensor

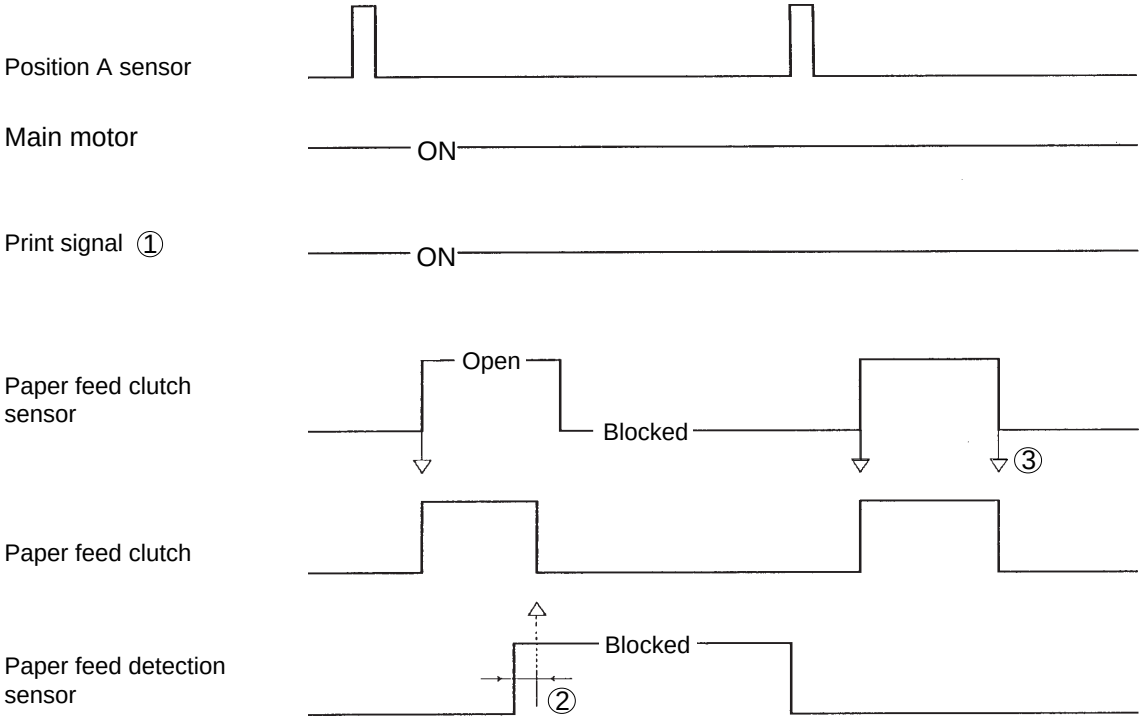


THEORY OF OPERATION

Test Mode No. 24 Paper feed clutch sensor:
– Short interval beeps when light path is blocked.
No. 25 Paper feed detection sensor
– Short interval beeps when light path is blocked.
No. 67 Paper feed clutch(activated at Paper feed clutch sensor ON)

-Timing Chart -

First Paper Feed Rollers Rotary System (During Printing)



① The Print signal starts the paper feed operation. If the light path of the Paper feed clutch sensor is opened while the Print signal is ON , the Paper feed clutch is engaged.
② After the Paper feed detection sensor detects the leading edge of a sheet, the Paper feed clutch is disengaged.
The OFF timing of the Paper feed clutch can be changed by setting of the paper type in the user mode and setting of the Test mode.
③ When the light path of the Paper feed clutch sensor is blocked, the Paper feed clutch is disengaged.

- **The conditions for the Paper feed clutch's engagement**
  (All of the following three conditions are requisite.)
  1. The Print signal is output (ON).
  2. The light path of the Paper feed clutch sensor is opened.
  3. The Stack paper feed sw is not actuated ON.

- **The conditions for the Paper feed clutch's disengagement**
  (Any one of the following four conditions is enough.)
  1. The Print signal is not output (OFF).
  2. The Paper feed detection sensor detects the leading edge of a sheet.
  3. The light path of the Paper feed clutch sensor is blocked.
  4. The Stack paper feed sw is actuated ON.

LED P-IN Paper feed detection sensor
– Lights up when light path is blocked.

8. First Paper Feed Rollers Rotary System (Activate by Drum angle)

- Basic

The Scraper and Pickup rollers are driven by the Paper feed clutch.

- Paper Feed Clutch

When the Main motor activates, the Drum rotates in the clockwise deirection (looking from back of the machine).
The Paper feed clutch activates at a certain Drum angle from the Position-A.
This Drum angle is determined by the count signal from the motor encoder sensor.
The clutch is released as the Drum rotates for a certain set degrees after the Paper sensor detects incoming paper.

- Transmission of Rotation Power

The Paper feed clutch is driven by the Main belt.
When the Paper feed clutch is activated, clutch components are engaged by the electromagnet, transmitting the rotation of the Main belt to the Pickup roller via the Pickup roller shaft.
The Pickup and Scraper rollers drive paper to the second paper feed section.

- Prevention of Brake Effect by Pickup and Scraper Rollers

The Pickup and Scraper rollers have one-way bearings built-in.
The one-way bearings allow the paper to feed into the second paper feed section freely.

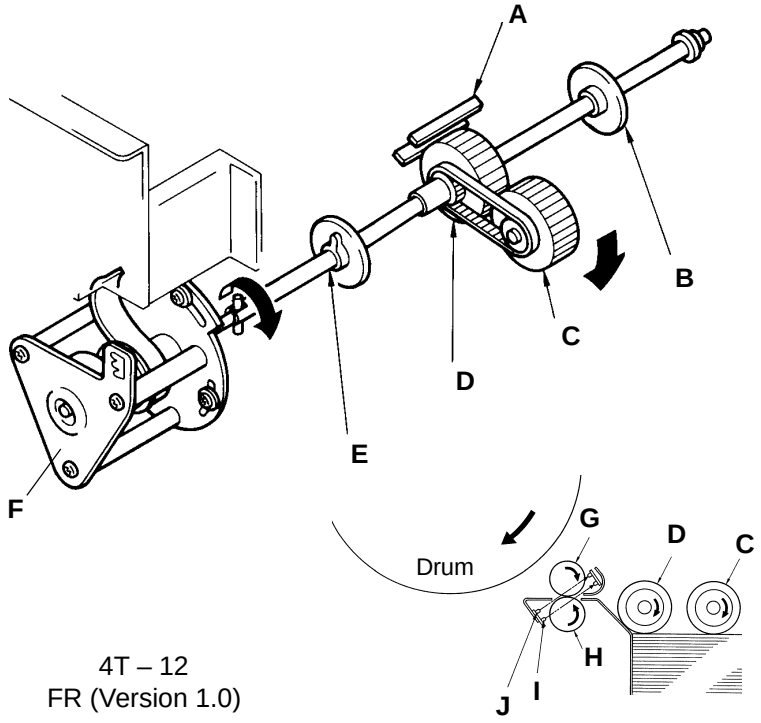
- Paper Feed Detection Sensor

To monitor the timing of paper transfer to the second paper feed section, a photo sensor, i.e. Paper feed detection sensor, is installed before the Guide roller.
When the Paper feed detection sensor detects paper, the paper feed clutch is disengaged a preset period later and the first paper feed operation is completed.
At this time, the leading edge of the paper comes into contact with the guide and timing rollers to sag. In order to cause the paper to sag at a constant rate before second paper feed starts, even if a printing speed changes, the OFF timing of the paper feed clutch is changed depending on the printing speed and the type of printing paper used.(Note 1)
If the Drum rotates 155° from 0° position before the Paper feed detection sensor detects paper, the paper feed clutch is disengaged at once to end the first paper feed operation even though the Paper feed detection sensor has not detected paper.

[Note 1]

The paper sag rate can be adjusted depending on setting of the paper in the user mode and the paper feed clutch OFF delay time of the Memory switch(Test mode).

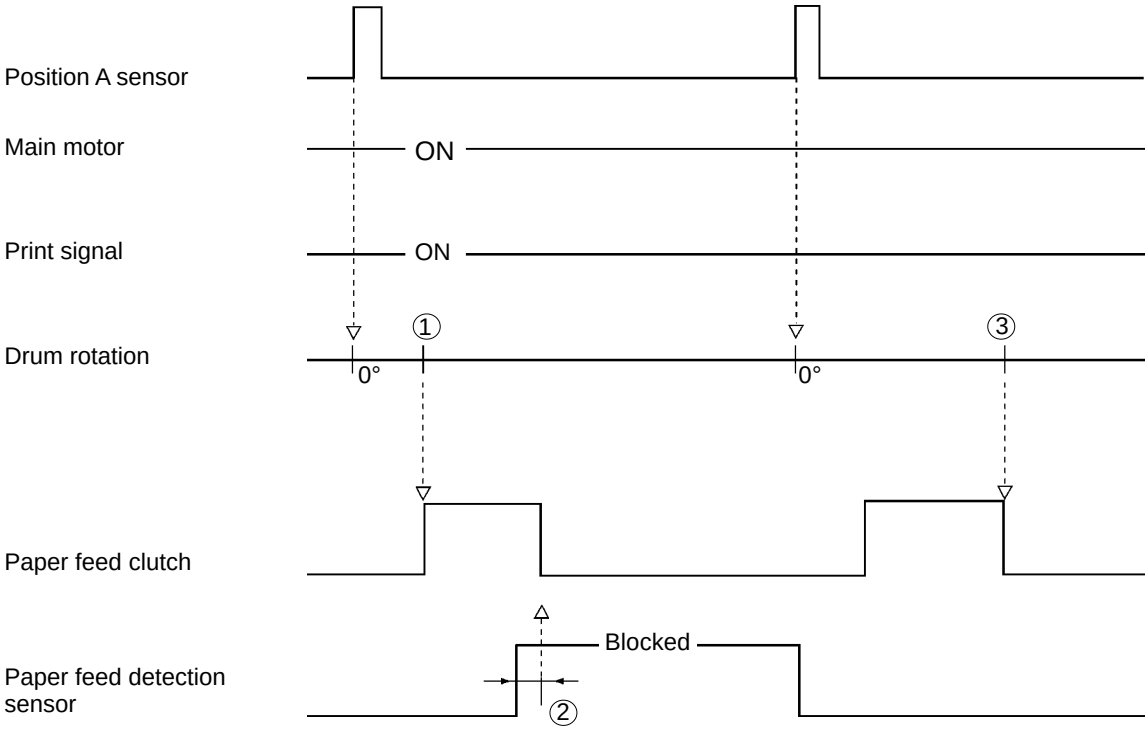
A: Paper sensor PCBs
B: Paper guide roller
C: Scraper roller
D: Pickup roller
E: Pickup roller shaft
F: Paper feed clutch
G: Guide roller
H: Timing roller
I: Paper feed detection sensor
J: Paper sensor



Test Mode No. 25 Paper feed detection sensor
– Short interval beeps when light path is blocked.
No. 67 Paper feed clutch

-Timing Chart -

First Paper Feed Rollers Rotary System (During Printing)



① The Paper feed clutch activates each time the Drum rotates 32° from the 0° position.
② After the Paper feed detection sensor detects the leading edge of a sheet, the Paper feed clutch is disengaged.
Paper feed clutch OFF Timing can be adjusted by Memory Switch (Test Mode).
③ The Paper feed clutch is deactivated when the Drum rotates 155° from the 0° position.

- **The conditions for the Paper feed clutch's engagement**
  (All of the following three conditions are requisite.)
  1. The Print signal is output (ON).
  2. The Drum rotates 32° from the 0° position.
  3. The Stack paper feed sw is not actuated ON.

- **The conditions for the Paper feed clutch's disengagement**
  (Any one of the following four conditions is enough.)
  1. The Print signal is not output (OFF).
  2. The Paper feed detection sensor detects the leading edge of a sheet.
  3. The Drum rotates 155° from the 0° position.
  4. The Stack paper feed sw is actuated ON.

9. Paper Pickup System

Feeding

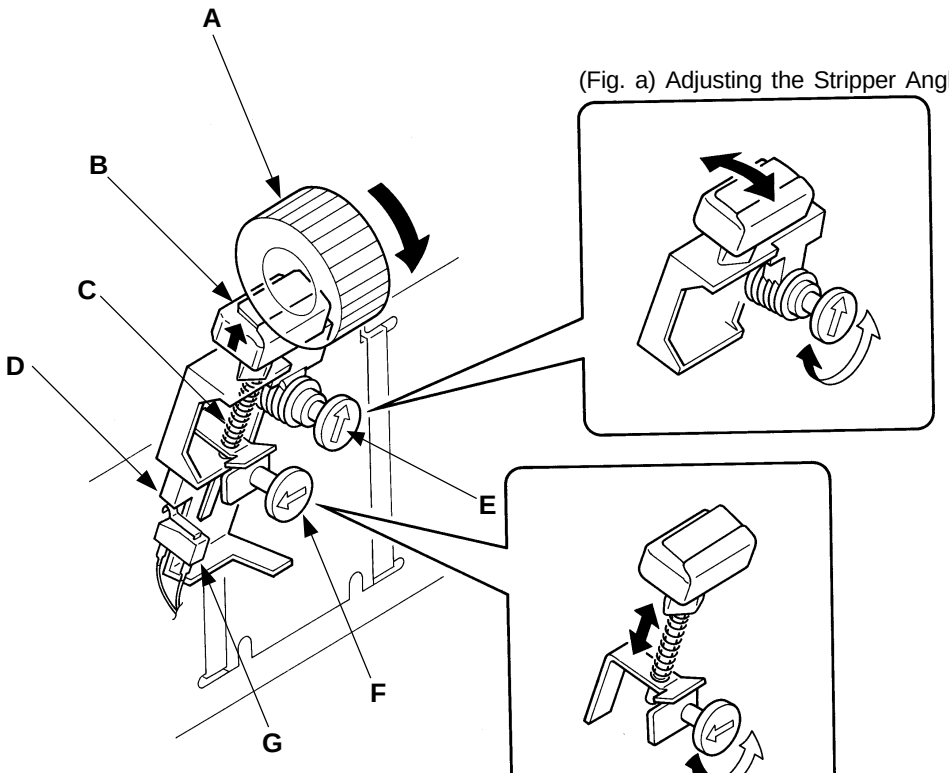
- The papers on the Paper feed tray are fed by the Scraper roller, in several layers, in between the Pickup roller and Stripper plate.

Pick-up

- The top sheet is separated from the rest by the Pickup roller and Stripper plate.
- The Stripper plates is pushed against the Pickup roller by the Stripper spring to provide resistance against paper feed, by which only a single sheet of paper is fed from the paper stack.
- The Stripper unit has Pressure adjust dial and Angle adjust dial which changes the stripper pressure against paper feed.

- Detection of Stack Paper Feed

If multiple sheets of paper are fed, the stripper plate is pushed down, causing the switch plate to contact the actuator of the Stack paper feed switch.
When the Stack paper feed switch is pressed, the Paper feed clutch is disengaged to stop feeding paper.



(Fig. a) Adjusting the Stripper Angle

(Fig. b) Adjusting the Stripper Pressure

A: Pick-up Roller
B: Stripper Pad
C: Stripper Spring
D: Actuator Plate
E: Stripper Angle Adjustment Dial
F: Stripper Pressure Adjustment Dial
G: Stacker Paper Feed Switch

Test Mode No. 102 Elevator operation
No. 2 Paper size det. sensor
– Short interval beeps when reflected light detected.
No. 40 Paper feed safty switch
– Short interval beeps when released.

REMOVAL & ASSEMBLY

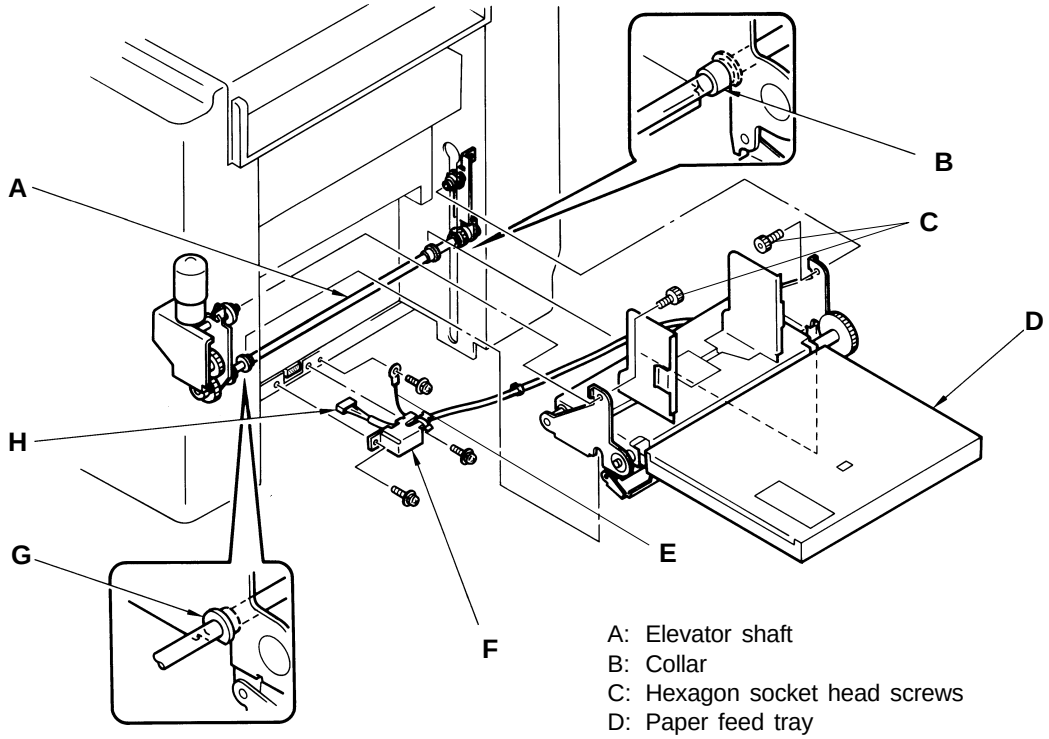
1. Paper Feed Tray Unit

< Removal Procedure >

1. Select Test mode **No. 102**.
   Press the Paper feed tray down button to raise the tray about a third way up.
   Turn OFF the power.
   In order to remove the connector cover under the paper feed tray. Move the paper feed tray down to the lowest position when removing the paper guide plate
2. Remove the screw securing the ground wire on the frame under the Stripper unit.
3. Remove two screws holding the Connector cover located under the Stripper unit.
4. Pull out the wire harness until the connector comes out from under the Stripper unit. Disconnect the connector.
5. Remove two hexagon socket head screws and dismount the Paper feed tray unit.

- Precautions in Assembly -

- Make sure to mount the Paper feed tray firmly on collars on both sides.
- If the connector of the wire harness is disconnected, the machine assumes the Paper feed tray safety sw (bottom) is not actuated ON and prevents the Elevator motor from operating.



A: Elevator shaft
B: Collar
C: Hexagon socket head screws
D: Paper feed tray
E: Ground wires
F: Connector cover
G: Collar
H: Connector

2. Paper Size Potentiometer

< Removal Procedure >

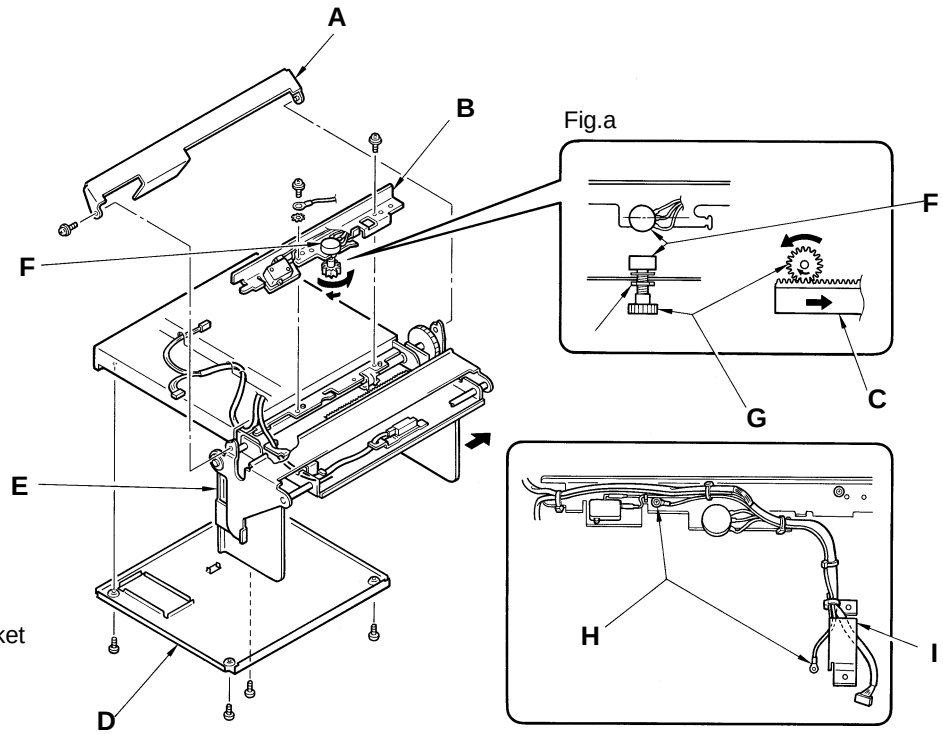
1. Remove the Paper feed tray unit.
2. Turn the tray upside down and remove the Actuator plate.
3. Remove two mounting screws on the Size VR bracket, and remove the bracket.
   A Ground wire and a washer will be removed at the same time.
4. Loosen the nut on the Paper size potentiometer, and remove the potentiometer together with the Wire harness assembly attached.
   The potentiometer is replaced together with the Wire harness assembly.
5. Remove four screws on the Feed board and remove the board.
   Disconnect the wire harness connector of the Paper size sensor.

- Precautions in Assembly -

1) Attach the Paper size potentiometer to the size VR bracket. When this is done, catch it with a hexagonal nut and washer. The meter terminals should be set parallel to the size VR bracket.(See Fig. a)
2) Fit the size gear into the rotary shaft of the Paper size potentiometer(be careful not to lose a parallel pin).
3) When attaching the size VR bracket to the Paper feed tray body, open the Side guide fully, turn the size gear of the Paper size potentiometer fully in the opening direction, and return it by about 9 threads to engage it with the Slide rack.

- Adjustments and checks after installation

- Paper Width Data (page 4A-1).



A: Actuator plate
B: Size VR bracket
C: Slide rack
D: Feed board
E: Side guide
F: Paper size potentiometer
G: Size gear
H: Ground wire
I: Connector cover

3. Paper Feed Tray Slide Motor, Paper Feed Tray Safety SW, Paper Feed Tray Position Sensor (A3 model)

< Removal Procedure>

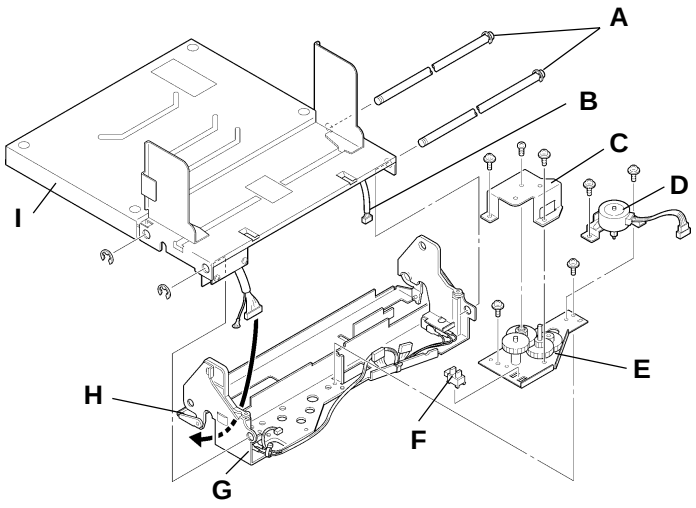
1. Remove the Paper feed tray from the main body(page 4R-1).
2. Remove a mounting screw of the actuator plate of the paper feed tray safety switch to remove the actuator plate.
3. Remove the E-ring each from one side of the Paper feed tray shafts,draw them out from the paper feed tray, and separate the paper feed tray(Upper) and paper feed tray(Lower), and unplug a connector.
4. Remove three mounting screws of the Gear cover and remove the cover.

Paper Feed Tray Slide Motor

5. Remove two mounting screws on the Paper feed tray slide motor and remove the motor.

Paper Feed Tray Position Sensor

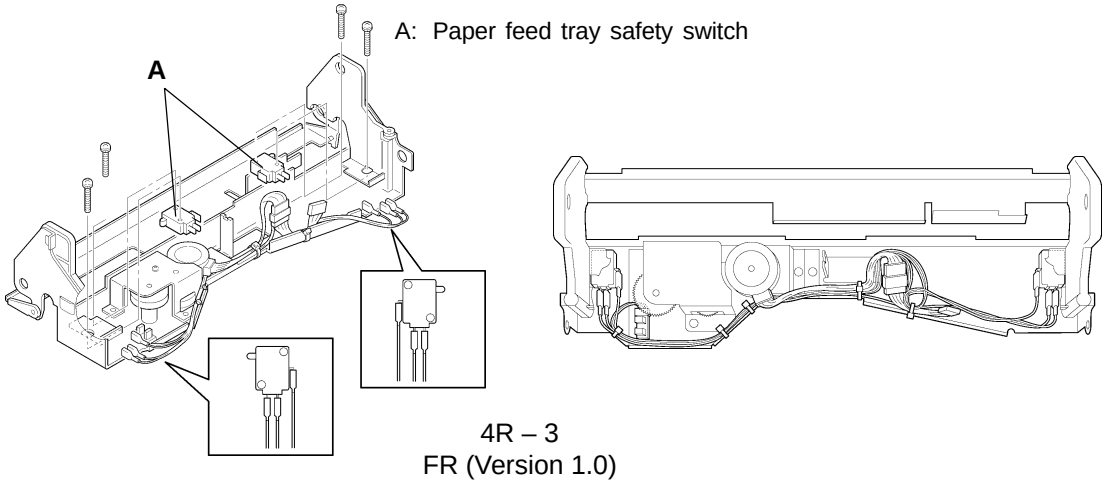
5. Remove two mounting screws on the Drive gear bracket and remove the bracket with the position sensor.
6. From the back of the Drive gear bracket, detach the fingers of the positon sensor from the bracket.



A: Paper feed tray shaft
B: Connector
C: Gear cover
D: Paper feed tray slide motor
E: Drive gear bracket
F: Paper feed tray position sensor
G: Paper feed tray(Lower)
H: Actuator plate
I: Paper feed tray(Upper)

Paper Feed Tray Safety Switch

4. Remove the two setscrews each of the safety switches attached to the left and right of the paper feed tray(Lower) to detach the switches.
5. See the figure below for the wiring of the safety switches.



A: Paper feed tray safety switch

4. Scraper Unit

< Removal Procedure >

1. Move the paper feed tray to the lowest position, turn off the power, and remove the scraper cover.
2. Lower the Paper feed pressure adjustment lever and remove two mounting screws on the Paper feed cover.
   Disconnect a wire harness connector and remove the cover.
3. Remove the Lock ring from the right end of the Pickup roller shaft.
   Slide the unit to the right and unhook the left end of the shaft from the Paper feed clutch shaft.
   [IMPORTANT]
   Be careful not to damage the actuator of the Elevator upper limit sensor.
4. Remove the unit from the machine by bringing out the left end of the shaft first.
   [Note]
   If the paper guide rollers hit against the Upper limit sensor bracket during the removal, slide the Paper guide rollers.

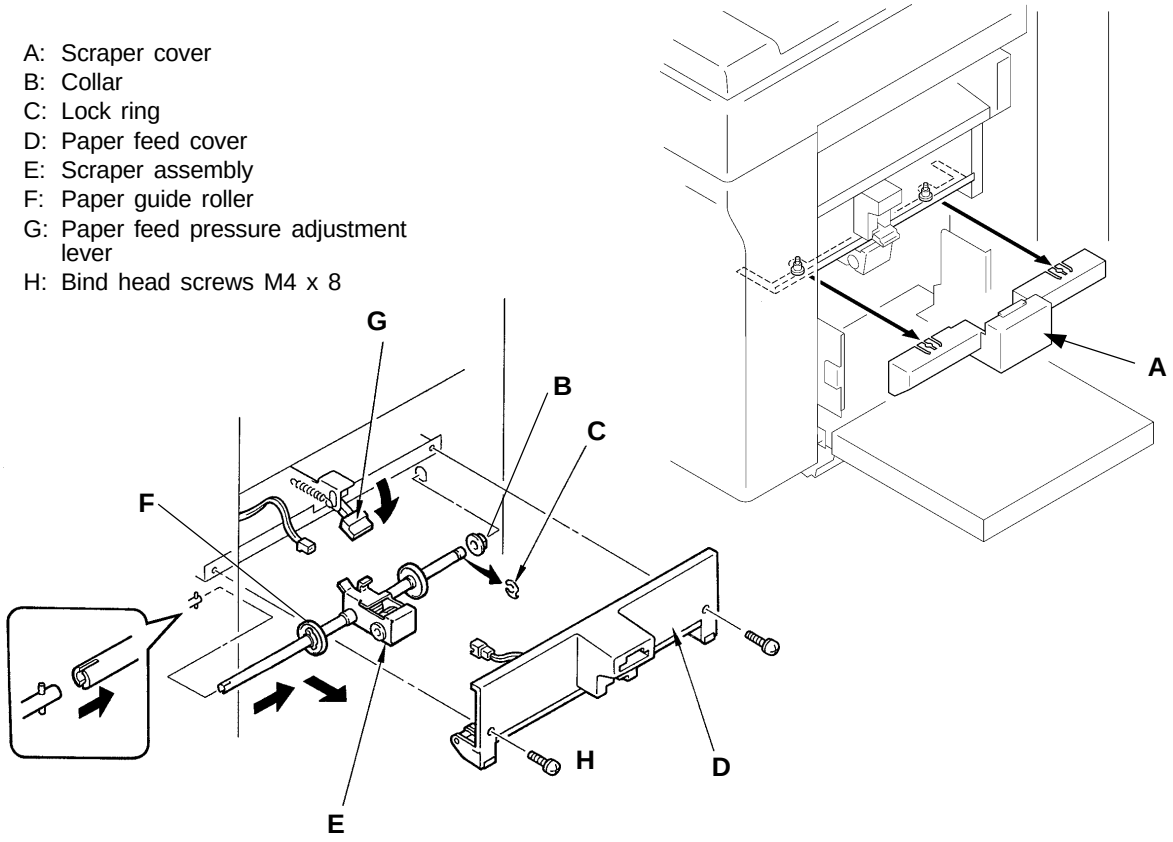
- Precaution in Removal -

- Be careful not to drop and lose the collar when removing the Scraper unit.

- Precautions in Assembly -

- Be careful not to damage the actuator of the Elevator upper limit sensor.
- Be careful not to break the Scraper cover.

A: Scraper cover
B: Collar
C: Lock ring
D: Paper feed cover
E: Scraper assembly
F: Paper guide roller
G: Paper feed pressure adjustment lever
H: Bind head screws M4 x 8



5. Scraper and Pickup Rollers

< Removal Procedure >

Scraper roller

1. Remove two Lock rings and collars from the ends of the Scraper roller shaft.
2. Remove the Scraper roller from the shaft.

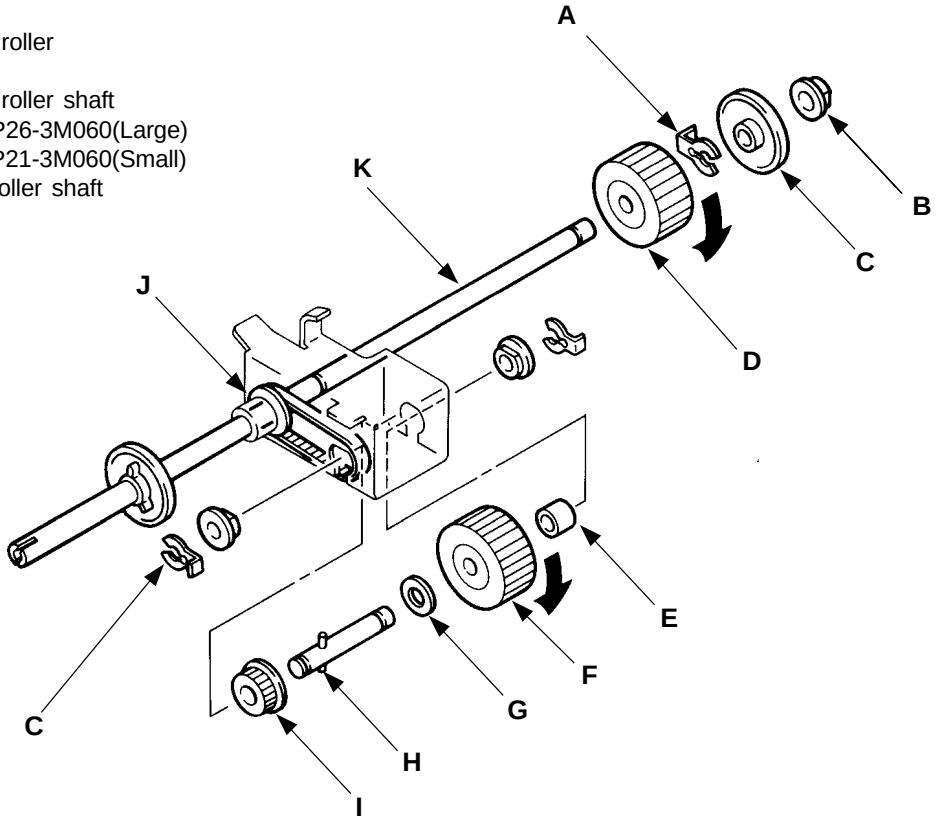
Pickup roller

1. Move the paper feed tray to the lowest position, turn off the power, and remove the scraper assembly(see the previous page).
2. Slide out the Paper guide roller on the right half of the Pickup roller shaft.
3. Remove the Lock ring on the right side of the Pickup roller and remove the roller from the shaft.

- Precautions in Assembly -

- As one-way bearings are built into the Scraper and Pickup rollers, be careful of the rotational direction upon installation.
  If the rollers are installed on the shafts in the wrong way, the rollers will not rotate when the Pickup roller shaft is turned.
  Check that the rollers rotate freely if turned towards the paper feed direction (the direction indicated by arrows in the figure below).

A: Lock ring
B: Collar(thick)
C: Paper guide roller
D: Pickup roller
E: Collar
F: Scraper roller
G: Washer
H: Scraper roller shaft
I: Pulley; P26-3M060(Large)
J: Pulley; P21-3M060(Small)
K: Pickup roller shaft



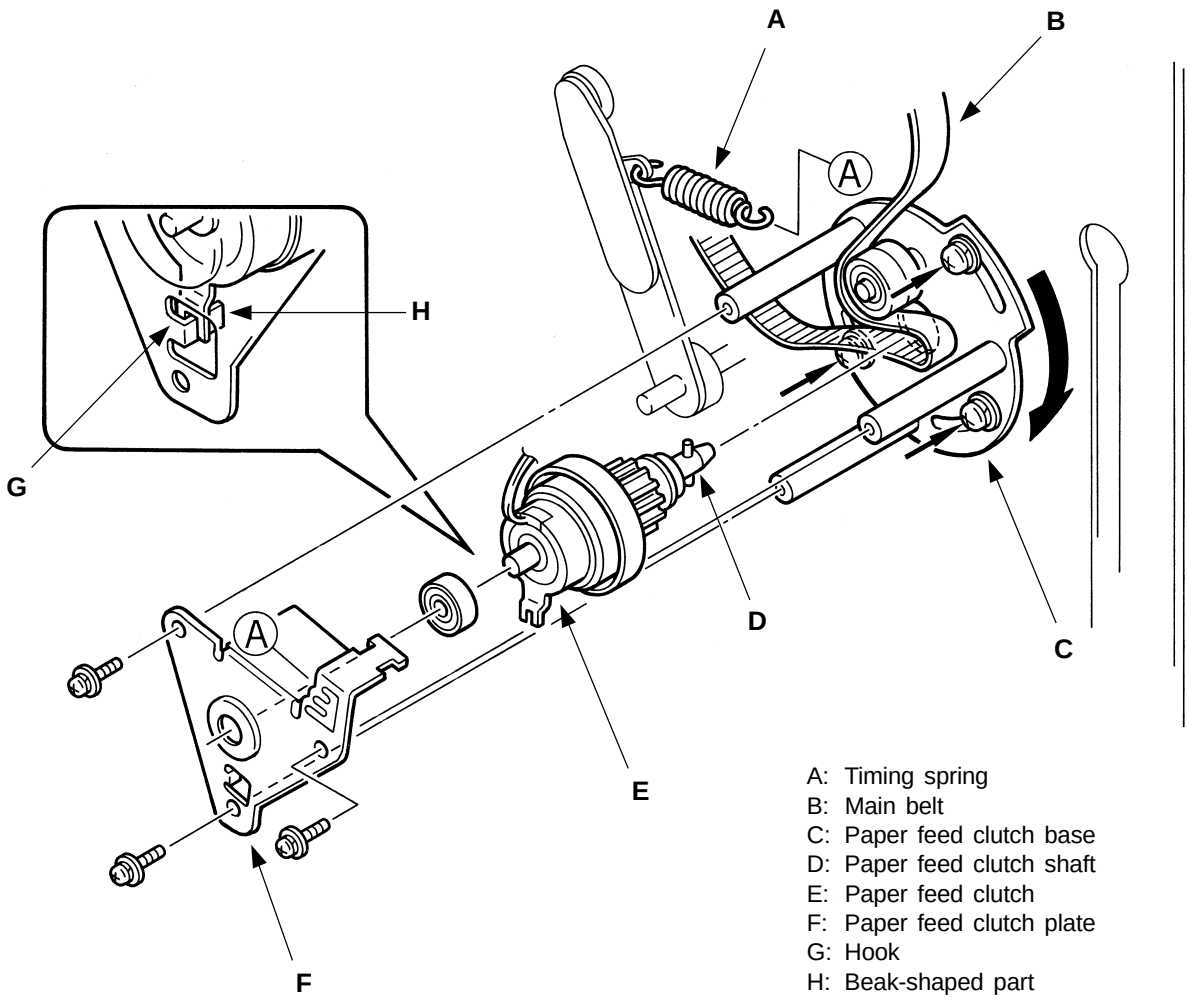
6. Paper Feed Clutch Ass'y

< Removal Procedure >

1. Turn OFF the power and remove the Back cover and scraper unit.
2. Remove the Timing spring.
3. Loosen three mounting screws on the Paper feed clutch base and turn the Paper feed clutch unit clockwise to release the tension of the Main belt.
4. Remove three mounting screws on the Paper feed clutch plate and remove the plate.
5. Pull the Paper feed clutch ass'y toward you and disengage the Paper feed clutch shaft from the Pickup roller shaft.
6. Disconnect the connector of the Paper feed clutch, disengage the Main belt from the Paper feed clutch pulley and remove the Paper feed clutch ass'y by pulling it further toward you.

- Precautions in Assembly -

- Make sure to engage the beak-shaped part of the Paper feed clutch with the hook of the Paper feed clutch plate.



A: Timing spring
B: Main belt
C: Paper feed clutch base
D: Paper feed clutch shaft
E: Paper feed clutch
F: Paper feed clutch plate
G: Hook
H: Beak-shaped part

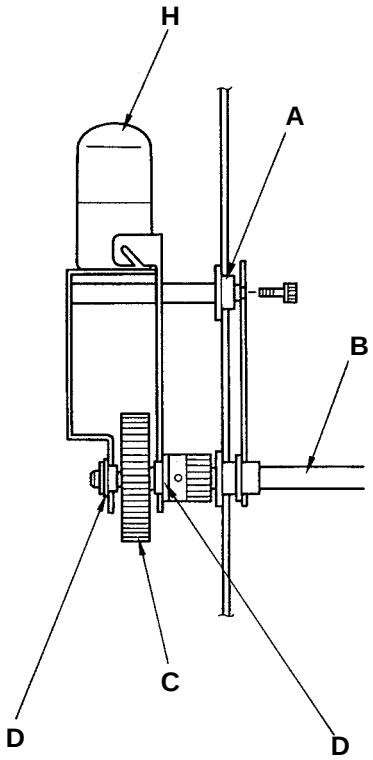
7. Elevator Motor Unit

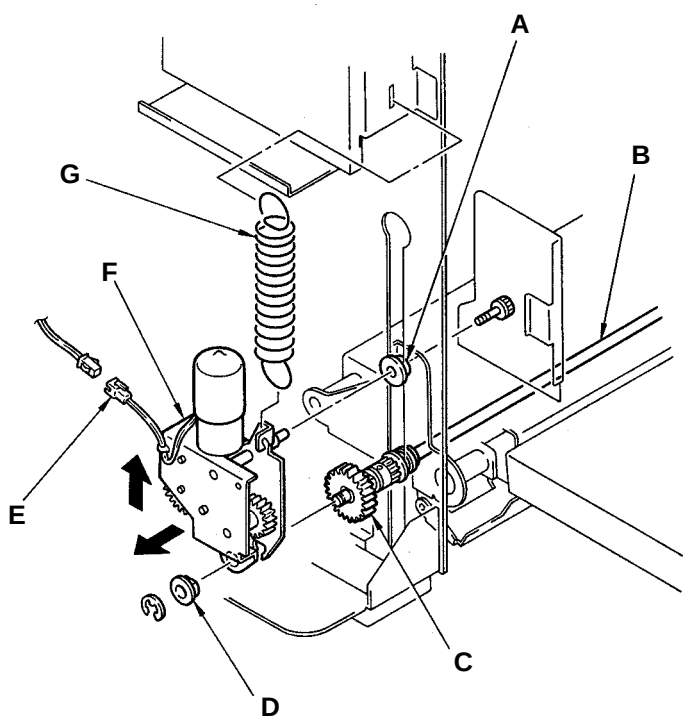
< Removal Procedure >

1. Raise the Paper feed tray a little (by approx. 5mm) if it is positioned at the bottom, using Test mode **No.102**.
   [Note]
   In case the Elevator motor doesn't operate, raise the tray by manually rotating the worm gear of the Elevator motor.
2. Remove the Carrying grasp (a white plastic box) from the Bottom plate (left) by removing a tapping screw.
3. Remove the Elevator spring and the hexagon socket head screw securing the Paper feed tray unit on the Drive base side.
4. Disconnect the connector of the Elevator motor.
5. Remove the E-ring securing the collar at the end of the Elevator shaft and remove the collar.
6. Pull the Elevator motor unit toward you and lift it up off the Elevator shaft.

- Precautions in Assembly -

- Always put white grease on plastic gears in the Elevator motor unit and the Elevator gear after assembly.
- Position the Elevator shaft a little up before starting assembly.
- Put the Elevator collar on the upper shaft of the Elevator motor unit.





A: Elevator collar
B: Elevator shaft
C: Elevator gear
D: Collar
E: Connector
F: Elevator motor unit
G: Elevator spring
H: Elevator motor

8. Stripper Unit

Removal

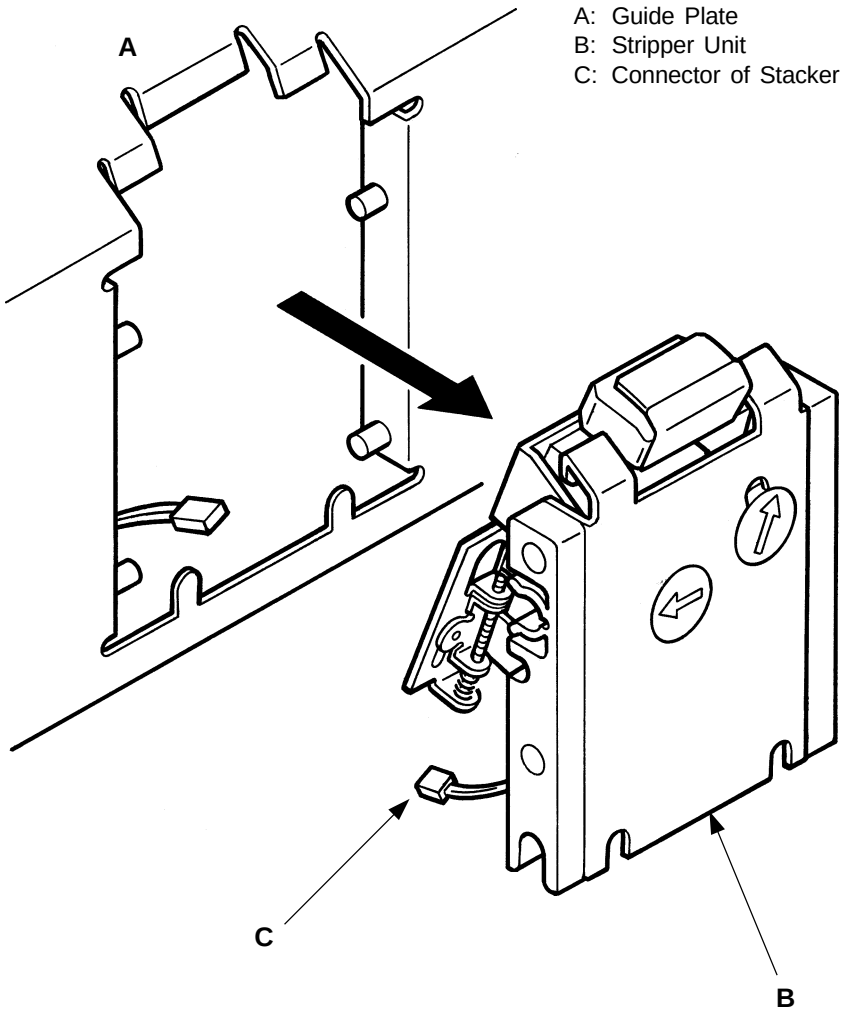
1. Move the paper feed tray down to the lowest position and turn off the power.
2. Set a finger on the upper part of the stripper unit and pull it out to the near side.
3. Disconnect the connector of the Stack paper feed switch hidden behind the guide plate and remove the stripper unit.

Precaution in Assembly

- With the stripper assembly pushed inside, set onto the guide plate.
- Remember to insert the connector of the Stack paper feed switch.

Adjustment after Assembly

- Stripper Pad Pressure. (page 4A-3)
- Position of the Stack Paper Feed switch (page 4A-4)



A: Guide Plate
B: Stripper Unit
C: Connector of Stacker Paper Feed SW

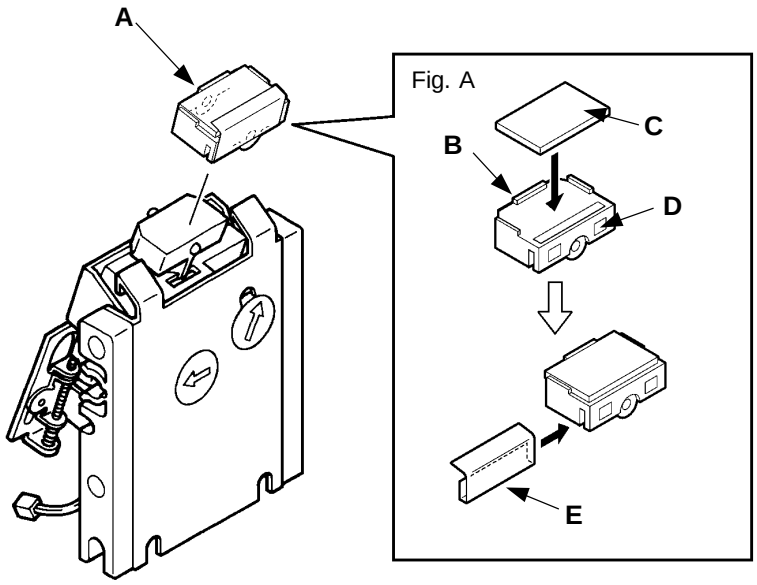
9. Stripper Pad

Removal

1. Move the paper feed tray down to the lowest position, turn off the power, and remove the stripper unit.
2. Raise the stripper pad manually and remove it.

Precautions in Assembly

- There are two kinds of stripper pads. Choose a proper one according to the user's paper type.



A: Stripper Assembly
B: Convex Part
C: Stripper sheet
D: Stripper pad
E: Stripper cover

Normal Friction	High Friction
Yellow	Gray
Stripper pad; 70	Stripper Pad; U

MEMO

ADJUSTMENT

1. Paper Width Data

1. Set the A4-size paper on the paper feed tray and adjust the Paper side guides properly to the paper size.
2. Start up the Test Mode No. 222(Memory switch) and make sure that the paper size potentiometer displays “210 mm.”
3. If not displaying “210 mm,” select the Test Mode No. 222(Memory switch) to make adjustment.
4. Cancel the Test Mode(Memory switch) to return to the normal screen.
5. Set the standard paper on the paper feed tray and make sure that a correct paper size is displayed.

Precautions for Adjustment

- If the paper size potentiometer does not display “210 mm” after adjustment in the Test Mode(Memory switch), its mounting position is dislocated. Attach it properly.
  If the display is unstable or does not change by moving the Paper side guides, it is likely that the connector of the paper feed tray and that of the PCB may be disconnected.

Results of Misadjustment

If the reading width of the paper size potentiometer is incorrect, the proper paper size will not be displayed even if the standard paper is set.

Adjustment of Test Mode(Memory Switch) No. 222

Memory SW	9	A	B	C	D	E	F	0	1	2	3	4
Adjustment Amount(mm)	-7	-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4

5	6	7	8
+5	+6	+7	+8

Decrease ◄——— Adjustment Amount ———► Increase

2. Position of Elevator Upper Limit Sensor

1. Remove paper from the Paper feed tray.
2. Switch the paper feed pressure adjustment lever to “NORMAL.”
3. Enter Test mode **No.102**.
4. Press the Elevator down botton until the Paper feed tray elevates and stops at the top position.
5. Confirm that the gap between the Pickup roller and the Paper feed tray is **1.5±0.5mm**.
6. If the measurement is off, loosen the screw holding the Upper limit sensor bracket and move the bracket up or down to adjust the top position of the Paper feed tray.

- Precautions in Adjustment -

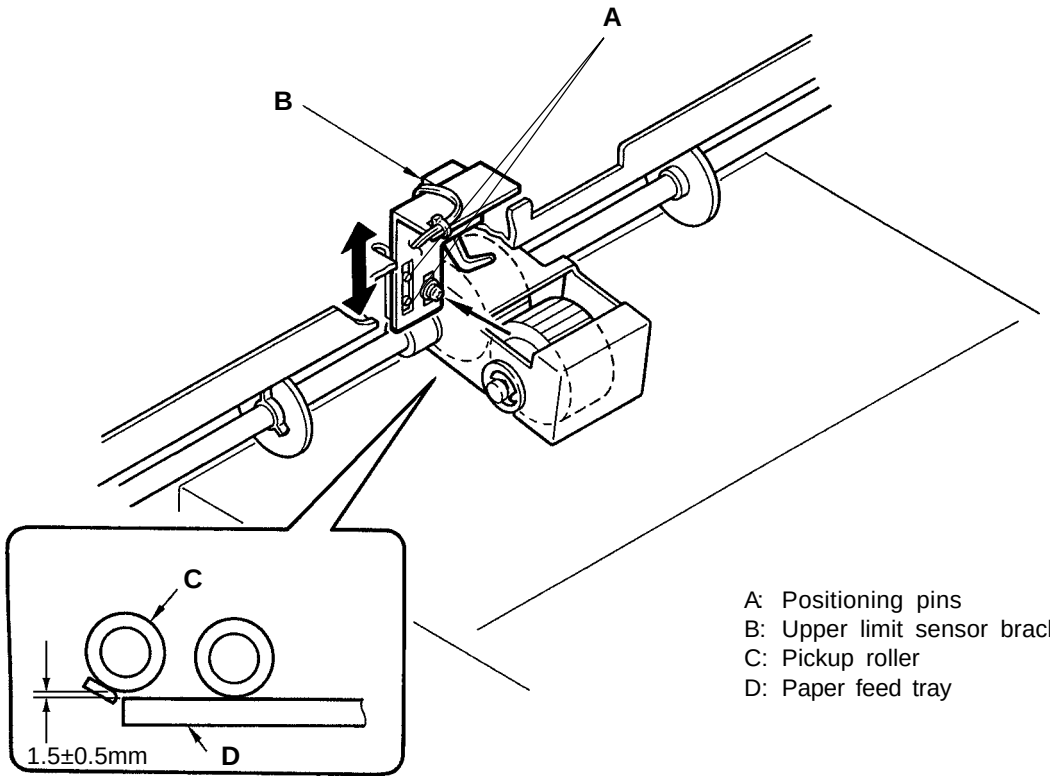
- Do not confuse the Pickup roller with the Scraper roller when measuring the space.
- The upper-limit stop position of the paper feed tray changes slightly by switching the paper feed pressure adjustment lever.(If the lever is switched to “CARD,” the upper-limit stop position of the paper feed tray will be raised slightly)

- Checking after Adjustment -

- Check the actual paper feed state. If stacked paper or no paper is fed, make fine adjustment of the elevator upper-limit sensor’s position as required, as well as adjustment of the stripper pressure and angle of the stripper pad.

- Results of Misadjustment -

- If the Upper limit sensor is set too high;
  the paper feed pressure becomes strong and multiple sheet feedings will occur.
- If the Upper limit sensor is set too low;
  the paper feed pressure becomes weak and paper will skip or misfeed.



A: Positioning pins
B: Upper limit sensor bracket
C: Pickup roller
D: Paper feed tray

3. Stripper Pad Pressure

1. Switch the paper feed pressure adjustment lever according to the type of paper and print.
2. When stacked paper or no paper is fed, adjust the stripper angle or pressure of the stripper pad.

(1) When stacked paper is fed

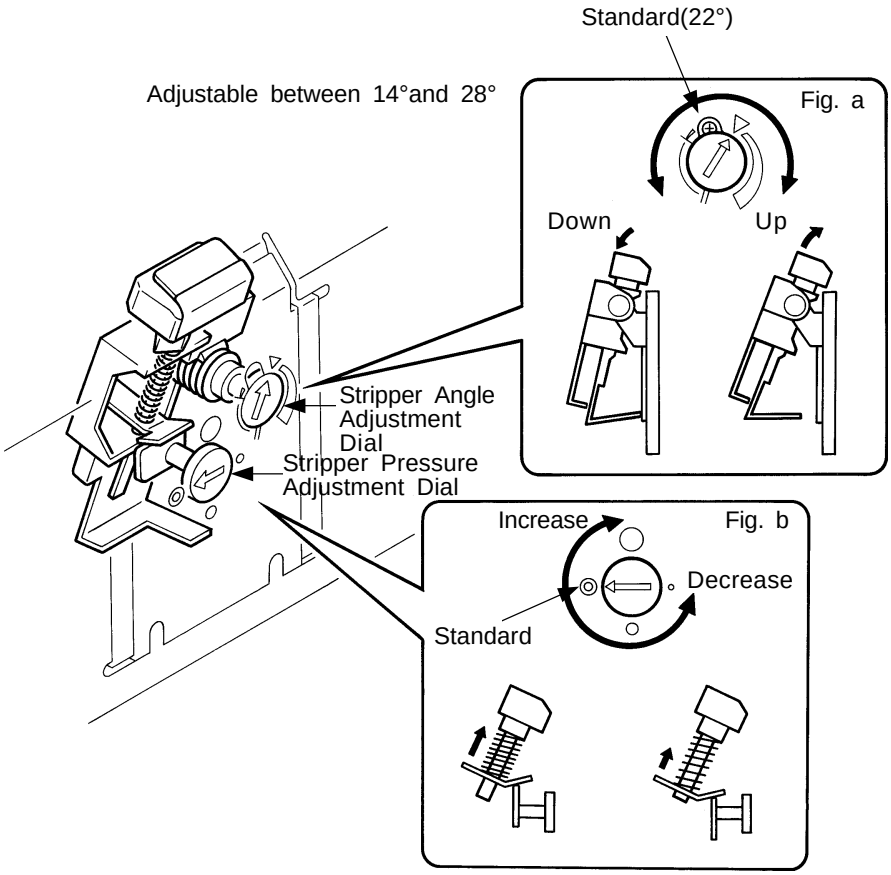
- Turn the stripper angle adjustment dial in the clockwise direction to increase the angle of the stripper pad.
- Turn the stripper pressure adjustment dial in the clockwise direction to increase the stripper pressure.

(2) When no paper is fed

- Turn the stripper angle adjustment dial in the counterclockwise direction to decrease the angle of the stripper pad.
- Turn the stripper pressure adjustment dial in the counterclockwise direction to decrease the stripper pressure.

Precautions for Adjustment

- If stacked paper or no paper feed cannot be corrected by adjusting the angle or pressure of the stripper pad, replace the stripper pad with another type.



4. Position of Stack Paper Feed Switch

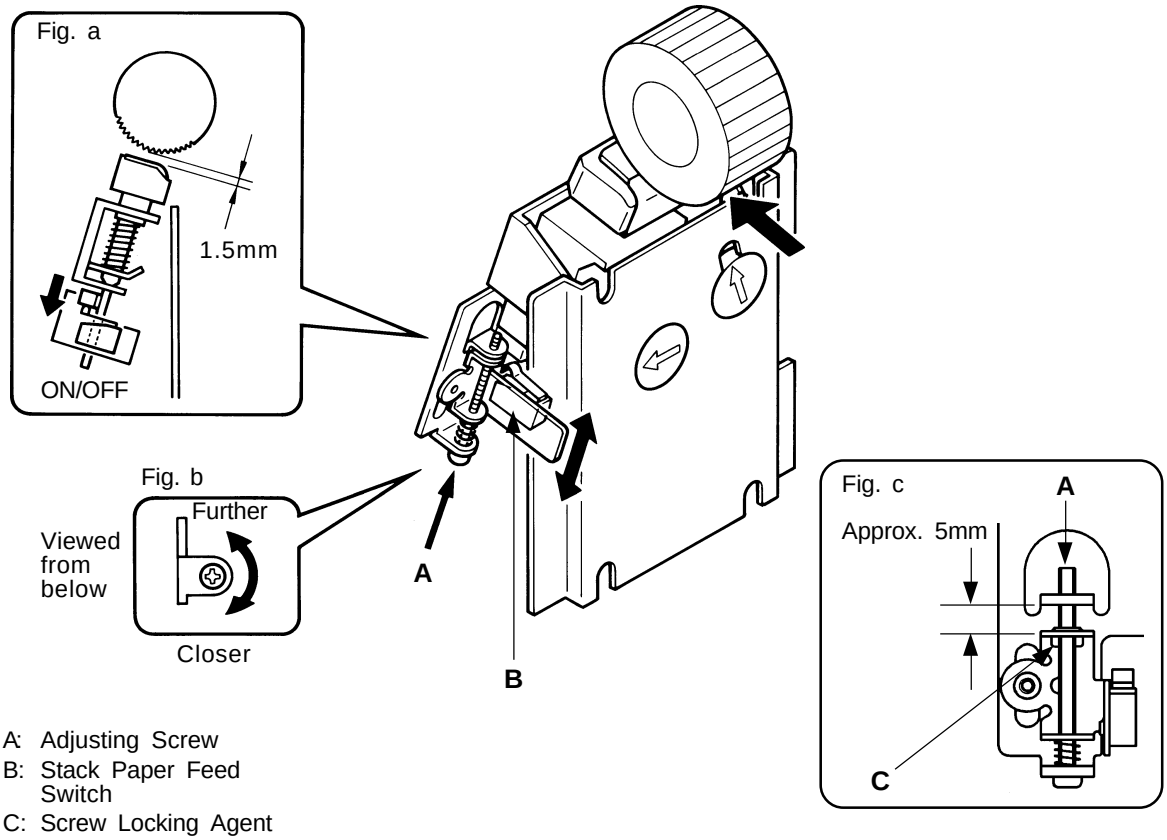
1. With the stripper unit attached to the main body, push down the Stripper pad slowly with a finger. After pushing them down about 1.5 mm, make sure that the Stack Paper Feed switch is pressed and clicks(Fig. a)
2. If other than the specified value, remove the stripper unit.
3. Turn the adjusting screw to make adjustment.
   - Viewing the adjusting screw from below, turning it counterclockwise causes the Stack Paper Feed switch to approach the actuator plate, and turning it clockwise causes it to go away.
   - One turn of the adjusting screw makes a change of about 0.5 mm.
   - The specified value is almost obtained by setting the distance marked with ★ to approx. 5 mm shown in Fig. C.
4. Finally, apply a screw locking agent to the adjusting screw(Fig. c) and attach to the main body.

- Precautions for Checking and Adjustment

- If the switch sound cannot be easily heard, turn on the Test Mode No. 67(paper feed clutch), press the SW1 of the System PCB to rotate the main motor at the slit section of the P-disc to check whether the paper feed clutch is activated or not.

- Results of Misadjustment -

- If the Stack Paper Feed switch is too close to the actuator plate, the switch will be pressed to turn off the paper feed clutch during printing, and if it has been pressed from the beginning, the paper feed clutch will not be turned on at all and “PAPER MISFEED CHECK PAPER FEED AREA AND PRESS ALL RESET KEY” will be displayed.
- If the switch is too far on the contrary, the paper feed clutch will not be turned off even if multiple sheets are fed at once, and the paper will jam in the secondary paper feed section, locking the drive unit or deforming the guide plate.



A: Adjusting Screw
B: Stack Paper Feed Switch
C: Screw Locking Agent

5. Position of P Disc (Start-time of First Paper Feed)

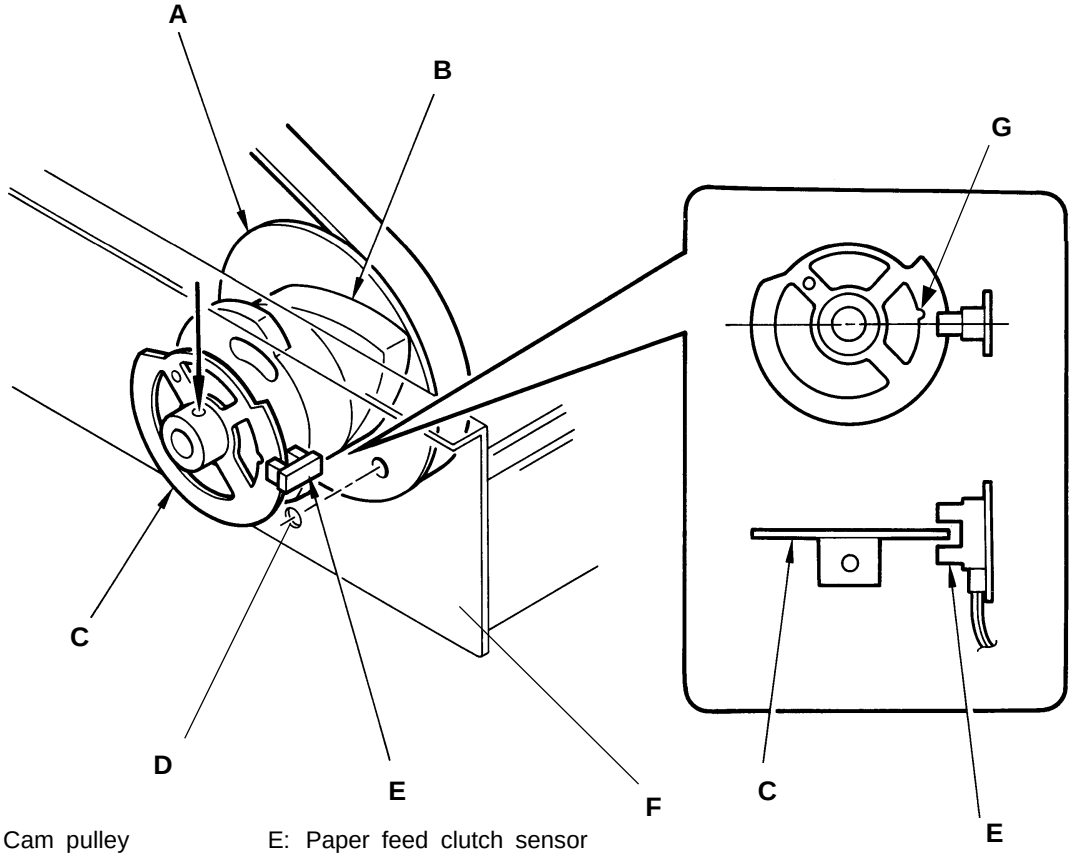
1. Check that the vertical print position is at the center and the Drum at the home position.
2. Check if the alignment notch of the P disc is positioned on a level with the top corner of the Paper feed cluth sensor as shown in the figure below.
3. If not, first check if the hole on the Main shaft face plate is aligned with the counterpart on the Cam pulley.
   If it is not aligned, adjust the arrangement of the Cam pulley.
4. If the alignment notch of the P disc is still not correctly positioned after confirming the hole alignment for the Cam pulley, loosen the allen screw securing the P disc and turn the P disc so that the alignment notch is positioned on a level with the top corner of the Paper feed clutch sensor.
5. Tighten the allen screw inside the P disc.
   [IMPORTANT]
   Secure the P disc so that it is positioned in the middle of the Paper feed clutch sensor as shown in the figure below.

- Precautions in Adjustment -

- Make sure that the P disc doesn't get contact with the inner surface of the Paper feed clutch sensor at any position by rotating the P disc with a press of SW1 on the System PCB.

- Results of Misadjustment -

- If the P disc is incorrectly positioned;
  paper will not feed correctly, causing paper feed errors or making print position unstable.



A: Cam pulley
B: Guide roller cam
C: P disc
D: Alignment hole
E: Paper feed clutch sensor
F: Main shaft face plate
G: Alignment notch

6. Paper Feed Mode (Paper Feed Clutch OFF Timing)

1. In the User Mode No. 04, adjust setting to the paper used and print.
2. If the paper is not fed smoothly during printing, adjust the paper feed clutch OFF delay time with the Memory switch(Test Mode) so that the paper will sag adequately in first paper feed.

- Results of Misadjustment

- If the paper feed clutch delay time is too late, a first paper feed rate will increase, resulting in breakage of the paper, or the end of the paper will be returned to the first paper feed side at second paper feed and “jams” without implementing second paper feed.
- If the paper feed clutch delay time is too early on the contrary, the paper will not sag properly, likely to result in “print registration problem” or “paper jam.”

User Mode No. 04

User Mode
04. PEPER FEED MODE
STANDARD / CARD / THIN / CUSTOM
Item /+ - Select / Start

Memory Switch(Test Mode) No. 232/234/236/238/240 Paper Feed Clutch OFF Delay Time Adjustment

Memory SW	9	A	B	C	D	E	F	0	1	2	3	4
Adjustment Amount(mm)	-7	-6	-5	-4	-3	-2	-1	0	+3	+6	+9	+12
	5	6	7	8								
	+15	+18	+21	+24								

Decrease ◄——— Adjustment Amount ———► Increase

Test Mode

No.232 Paper Feed Clutch OFF Delay Time Setting: (STANDARD)
No.234 Paper Feed Clutch OFF Delay Time Setting: (CARD)
No.236 Paper Feed Clutch OFF Delay Time Setting: (THIN)
No.238 Paper Feed Clutch OFF Delay Time Setting: (CUSTOM)
No.240 Paper Feed Clutch OFF Delay Time Setting with Special Paper Unit